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Maximising Export Returns: The use of digital media and smart technology in shopping and information gathering for food and beverages in markets relevant to New Zealand

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Executive Summary

The aim of this study is to inform New Zealand businesses of possible opportunities for increasing their export returns by improving their market access through digital media and smart technologies. This study explores the use of digital media and smart technologies by middle and upper class consumers of food and beverage products in China, India, Indonesia and compares this with consumers in Japan and the United Kingdom (UK).

New Zealand is a developed country which is dependent on its agricultural exports and has historically relied on key markets such as the UK. More recently, New Zealand's export focus has changed to include Asian markets such as China and Japan, and is exploring trade with countries with export growth potential such as India and Indonesia. It is therefore useful for New Zealand exporters to understand different cultures and preferences of consumers in these markets to assist in gaining market access and premiums for exported products as well as how new technologies can facilitate market access.

This study is part of a wider research project 'Maximising Export Returns (MER)', a three year project undertaken by the Agribusiness and Economics Research Unit (AERU) at Lincoln University funded by the New Zealand Ministry for Business, Innovation and Employment (MBIE). This project aims to explore how export firms can obtain price premiums from the credence attributes of their products and place these in overseas markets.

The new technologies include online shopping (e-commerce), social media and mobile devices (such as smartphones and tablets). The use of such technologies has increased internationally, with growing broadband internet use, online shopping, mobile social media and mobile device use (e.g. smartphone use). These technologies provide mechanisms for the effective marketing and sales of New Zealand food and beverage products overseas.

This study conducted an online survey of 1,000 consumers in the developing countries of China, India and Indonesia and the developed countries of Japan and the UK to determine digital media and smart technology use. The survey included the use of specific websites, online shopping, mobile devices, barcodes and Quick Response (QR) codes, as well as microchip reading technology (such as RFID and NFC technologies).

The results show that participants in all countries used social media, Wikipedia, food blogs, food company web pages, chat rooms and forums in searching for food and beverage information online. The use was higher in the developing countries of China, India and Indonesia than in Japan and the UK. Overall, the most popular websites for finding food and beverage information online across all countries were Wikipedia and social media, while the least popular were chatrooms and forums.

The highest percentage of online shopping for food and beverages was reported by Indian respondents, followed by Chinese and Indonesian participants, while the lowest use of online food and beverage shopping was reported by respondents from Japan. Reasons for using online shopping services varied between countries. For Chinese and Indian participants, generally lower prices online was the main reason for using online shopping. For Indonesian participants, the ability to make easier comparisons between products online was the main reason for using online shopping. In contrast, Japanese and UK participants indicated that the convenience of having products delivered was the main reason. Another reason for shopping online was to purchase products from overseas, or those that are not available domestically, which was especially important for Indonesian and Chinese participants.

The majority of survey respondents owned a mobile device. More than 70 per cent of respondents in each of China, India and Indonesia stated that they have used a mobile app for obtaining more information on food and beverages whilst only a third of UK and Japanese respondents claimed to have ever used an app for this purpose. Participants from China, India and Indonesia also reported a higher use of mobile devices for purchasing food and beverage products online than those from the UK and Japan.

Chinese participants used barcodes and/or QR codes more than other countries in the study to find more information about food and beverage products, this was followed by Indian participants. The majority of respondents from the UK and Japan stated they had never used their mobile device in conjunction with barcodes and/or QR codes for this purpose. The majority of Chinese and Indian participants stated that they had used barcodes and/or QR codes to purchase food and beverage products, while the majority of Indonesian, UK and Japanese respondents had not.

With regards to the frequency of use of microchip reading technology (e.g. RFID and NFC technologies), respondents from China, India and Indonesia indicated they used this more than participants from the UK and Japan.

Participants were also asked how often they used barcodes, QR codes and microchip reading technology in conjunction with their mobile device(s) to verify the credentials of food and beverages. The greatest use of barcodes for this purpose was shown by Indian participants, while QR codes were used more frequently by Chinese respondents. The majority of UK and Japanese respondents claimed to have never used a barcode or QR code for this purpose. The use of microchip reading for product verification had a lower uptake compared to QR codes and barcodes across all countries, with Indian participants indicating the highest frequency of use of this technology.

Finally, participants were asked to indicate the frequency at which they would use the different technologies for product verification if they were available. The intention to use these technologies if available was positive across all countries, with participants from Indonesia, India and China reporting they would be more willing to use these technologies than from the UK and Japan. In particular, the potential use of barcodes and QR codes was high in India and Indonesia. The intention to use microchip reading technology if available was lower for participants across all countries, with the highest intention to use signalled by Indian and Indonesian participants. The majority of Japanese and UK respondents indicated that they had no intention to use microchip reading technology for food and beverage product verification.

In summary, the results presented in this report showed that while all technologies are used in all countries, rates of uptake and use were observed to be generally higher for participants from the developing countries of China, India and Indonesia over the UK and Japan.

Chapter 1
Introduction

The aim of this study is to explore the use of digital media and smart technologies by food and beverage consumers in China, India, Indonesia, Japan and the United Kingdom (UK). The targeted consumer groups are the middle and upper class consumers who are more likely to engage with digital media and smart technologies, thus informing New Zealand industries of possible opportunities for increasing their export returns by improving their market access via digital marketing and sales strategies.

This study is part of a wider research project 'Maximising Export Returns (MER)', a three year project undertaken by the Agribusiness and Economics Research Unit (AERU) at Lincoln University funded by the New Zealand Ministry for Business, Innovation and Employment (MBIE). This project aims to explore how export firms can obtain price premiums from the credence attributes in their products and place these in overseas markets.

This report is based on a survey of two developed countries (Japan and the UK) and three developing countries (China, India and Indonesia) with a sample size of 1,000 consumers in each country. The survey included a set of questions to assess consumer attitudes towards credence attributes in food and beverages in the surveyed countries which is reported in Guenther et al. 2015.

This report, as stated, concentrates on access to key export markets through the use of digital media and smart technologies. This report builds on previous work of the AERU which showed that overseas consumers are frequently engaging with digital media and smart technologies in relation to food and beverage products (Miller et al. 2014; Saunders et al. 2015). In particular, this research showed that consumers in developing countries are engaging with these technologies more frequently and intensively than those in the developed countries, particularly in relation to food and beverage information gathering and purchasing behaviour. This is important as emerging countries such as China, India and Indonesia represent markets with growth potential for New Zealand exporters.

The report is structured as follows. In the next chapter, the background and methodology of the study is described. In Chapter 3, results on consumers' use of digital media and smart technologies in relation to food and beverage information gathering and purchasing behaviour is presented. Finally, conclusions are made in Chapter 4.

Chapter 2
Background and Methodology

This chapter starts with a description of the background to this study. It will then describe the methodology of the study, including sampling strategy, survey development, structure and its implementation.

2.1 Background

New Zealand is a developed country which is dependent on its agricultural exports. Historically, the UK was New Zealand's largest export market, taking almost all exports until 1960. However, the focus of New Zealand exporters has changed over the last few decades with a growth in exports to Asian markets, in particular to China. Since 2010, China has been New Zealand's key export market for agricultural commodities, facilitated through the signing of a Free Trade Agreement between both countries in 2008. In 2014, the export value of New Zealand's agricultural exports to China was valued at NZ$8.4 billion – a 64 per cent increase from the previous year (Statistics New Zealand 2014). In contrast, New Zealand's agricultural exports to India have fluctuated in recent years, but in 2010 India started negotiations towards a Free Trade Agreement with New Zealand which has the potential for India to become an important export market in the future (MFAT 2013). While other Asian markets like Japan are already well-established trading partners for New Zealand, Indonesia has some trade with New Zealand but has been identified as a potential growth market for the future. In particular, New Zealand's trade relationship with Indonesia has been given impetus by the Association of Southeast Asian Nations (ASEAN), Australia and New Zealand Free Trade Agreement (AANZFTA), into which Indonesia became a member in January 2012 (MFAT 2014).

Based on the cultural diversity of the range of countries targeted by New Zealand exporters, it is important to understand different cultures and preferences in these markets and how they differ from other markets in order to both gain access to these markets, as well as a premium for exported products. In particular, New Zealand's relatively small size (both economically and geographically) and geographical isolation from these markets requires exporters to consider alternative methods for gaining market access for their products.

One such channel for product communication is new technologies, particularly digital media and smart technologies. These include online shopping (e-commerce), social media and mobile devices (such as smartphones and tablets). These technologies provide mechanisms for the effective marketing and selling of New Zealand food and beverage products. It will be important for agribusiness supply chain managers to both understand and consider their use as it is essential to the development of effective digital marketing and sales strategies.

Consumers' use of the internet, including online shopping and social media, as well as mobile devices, has increased and is likely to grow further into the future. Internationally, broadband internet use has almost quadrupled between 2005 and 2015, with the Asia-Pacific region representing the largest user base in 2015 (ITU 2015). Likewise, the use of online shopping (or e-commerce) has increased globally, representing a total international value of US$1.7 trillion in 2015 (Statista 2015a), with sales expected to increase to the value of US$2.48 trillion by 2018 (Statista 2015b). E-commerce sales in the Asia-Pacific region are expected to outgrow those of North America to reach US$1.05 billion by 2017 (eMarketer 2014a), with total international value of business-to-consumer e-commerce expected to reach US$2.4 trillion by 2018 (eMarketer 2014b). Illustrating this development, Chinese online shopping website Alibaba became the fastest growing e-commerce website in 2014 (Dvorak et al. 2014), and recently generated US$14.3 billion

of transactions in a one-day sales event, with approximately 94 million consumer using their mobile phones to shop and mobile sales accounting for nearly US$10 billion of this (Rao 2015). Social media is also used extensively internationally, with the most popular site Facebook totalling 1.44 billion users in March 2015, 1.25 billion of which accessed the service using a mobile device (Facebook 2015). Social media use is expected to increase to 2.55 billion international users by 2017 (eMarketer 2013), with users currently spending significant amounts of their daily time on social media websites (Experian 2013; Simcott 2014).

Furthermore, the use of mobile devices has increased globally in recent years, with mobile phone subscriptions having more than tripled between 2005 and 2015. In addition, mobile broadband subscriptions have increased internationally by nearly 12 times between 2007 and 2015, with Asia-Pacific representing the region with the most users in 2015. This is particularly true of developing countries globally, for which mobile broadband subscriptions increased by approximately 54 times between 2007 and 2015 (ITU 2015).

The use of mobile devices in conjunction with other technologies or services is also growing. This includes the use of interactive elements such as barcodes and QR codes – 2-dimensional images usually affixed to a product's packaging, providing additional product information when scanned by a mobile device (Ebling 2010). The inclusion of QR codes on product packaging for New Zealand products has already been undertaken for Fonterra, Westland and Synlait infant formula products by dairy processor GMP Dairy, whereby a consumer can scan a unique QR code on an infant formula product using their smartphone to display information relating to the product's ingredients and authenticity (Stringleman 2014). Other interactive elements include the use of mobile wallets, such as Apple Pay or Google Wallet. These are based on technologies including Near Field Communication (NFC) and Radio Frequency Identification Devices (RFID), also found in MasterCard's PayPass or Visa's PayWave bank cards. The use of such technology is expected to increase in the future, with preliminary use of similar services already occurring in international markets. In the US, mobile commerce (*m-commerce*) retail revenue was valued at US$58.5 billion in 2013 (Statista 2015d), while UK m-commerce business-to-consumer m-commerce sales were valued at GBP 8.55 billion in 2013 (Statista 2015c). The international value of m-commerce (i.e. using a mobile device to purchase products) is expected to increase to approximately US$626 billion by 2018 (Madrigal 2014). This technology can also be used by consumers to access product information, promotional materials, or in conjunction with other forms of marketing, and is thus of interest to those involved with food and beverage marketing and sales in international markets. Therefore, this study examined, in part, the use of the above technologies in markets with high growth potential for New Zealand exports in order to assess means of gaining market access and capturing higher value in these markets.

2.2 Methodology

The method included a structured and self-administered online survey. Five surveys were conducted in March/ April 2015. The surveys involved two developed countries (Japan and the UK) and three developing countries (China, India and Indonesia). The survey was administered through Qualtrics™, a web-based survey system, and had a sample size of roughly 1,000 consumers in each country. The results of the survey were analysed using descriptive statistics to examine consumer attitudes towards and use of digital media and smart technologies, particularly in relation to food and beverage information gathering and purchasing behaviour in-market.

2.2.1 Sampling strategy

In surveys, different ways can be used to obtain a sample of consumers. In probabilistic sampling, theoretically, each person of the target population would be included in the sampling frame. Statistical methods enable then testing the sample representation, if the data of sample population

and the total population characteristics exists; hence with that the sampling error can be estimated (Dillman et al. 2009). Common methods to obtain random samples include telephone and/or mail surveys (Dillman et al. 2009); and in recent years also internet surveys have become increasingly popular.

Obtaining a probabilistic sample in internet surveys can be more challenging compared to the traditional survey methods (e.g. mail survey). In internet surveys, online panels[1] are commonly used including general population-, specialty-, proprietary- and election-panels (Callegaro et al. 2014a). These are considered as non-probabilistic/non-random sampling methods, as by definition, not all members of the population have access to the internet; and these panels are also likely to include people who are more regular and more experienced internet users (Callegaro et al. 2014b; Callegaro and Krosnick 2014). A disadvantage of non-probabilistic sampling methods is that they do not satisfy the classic conditions of the probability sampling where one can make statistical inferences of representativeness of the general population (Callegaro et al. 2014a). One solution is to include some auxiliary variables in the survey for which information on the population distribution is available (Callegaro et al. 2014a). These auxiliary variables can be used to adjust the sample if it is not representative of the population (e.g. using post-stratification, raking/rim-weighting or propensity scoring[2]) (Baker and Göritz 2014; Tourangeau et al. 2013). Another solution is setting up sample quotas. However, the challenge is often to retrieve data for these variables, especially across countries.

The existence of other potential biases in (non-probabilistic) survey samples need to be explored further. First, common in all online samples is a coverage bias. This results from the fact that not everyone has access to the internet, and that online panels are likely to include people who are more regular and skilled internet users (Callegaro et al. 2014b; Callegaro and Krosnick 2014). Whether the coverage bias is an issue, depends on the population of interest that the survey results are aimed to be aggregated to. For example, the use of digital technology generally requires language and literacy skills, and adequate socio-economic conditions (Wessels 2013). Thus the "offline population" is likely to include people with lower education or income (Callegaro et al. 2014a).

Another concern in online panels is the "professional", or more experienced survey respondents and associated concerns about data quality (Hillygus et al. 2014) as these respondents may

- Have different attitudes, opinions and/or beliefs compared to the less-experienced survey respondents;
- Rush through the survey focusing on receiving the incentive rather than being serious about the topic; and
- Answer strategically in order to avoid possible follow-up questions.

On the other hand, experienced respondents may be more consistent in their responses and can be more likely to answer sensitive questions (e.g. on income or race) and therefore improving the validity of the results (Hillygus et al. 2014). Thus, the level of concern including professional respondents is unclear as the evidence of the impact on the results is inconclusive and it can also be difficult to identify these respondents. One way to check the validity of responses is to exclude "too quick" answers (i.e., incentive seekers). Also, constantly selecting "don't know" options,

[1] In typical survey literature, panel refers to longitudinal data (i.e., many observations from one participant) whereas in online panels the term 'panel' refers to an *access panel* of potential respondents (Callegaro et al. 2014a).

[2] In post-stratification, each respondent is given a weight that is multiplied by an post-stratified adjustment factor; raking is used to adjust the sample so that, in total, sample is aligned with external population distribution; propensity scoring predicts the probability of a respondent belonging into a demographic group (Tourangeau et al. 2013).

"straight line" or gibberish in the open-ended questions answers can be an indication of measurement errors (Baker et al. 2010, as cited in Hillygus et al. 2014).

For this study, sampling involved the recruitment of participants from an online panel database of consumers for each country provided by an international market research company. These panels are profiled, broadly recruited and frequently refreshed by the company. The respondents for each survey are recruited by online marketing. The company holds a participation history of each panel member. Each respondent who completes the survey is compensated with a retail voucher.

Hence, the sample of this survey was comprised of a non-random/non-probabilistic survey panel of consumers in the countries of interest. Potential respondents were recruited by e-mail. The e-mail included a short description of the study, a link to start the online survey and instructions to run the survey.

Quota sampling is a common method to ensure that a maximum number of respondents from the population of interest is received (Callegaro et al. 2014). In this survey, quotas were enforced during the beginning of the questionnaire (Callegaro et al. 2014a). Quotas were set for annual household income in order to target the middle and upper class in each of the developing countries, i.e. China, India and Indonesia. In contrast, in Japan all income ranges were surveyed as they are all relevant to New Zealand exporters. In the UK, only the high income consumer segment was surveyed. This exception was made because in previous studies (Saunders et al. 2013; 2015) the sampling of all income ranges showed that UK respondents overall reported lower importance towards credence attributes in food than other countries, hence in this study the focus of the UK sample was on the high income segment in order to examine if their attitudes are different from the lower income segments that were previously surveyed. Quotas for annual household income were set in the respective currency of each country. Sample demographics for each country are presented in Appendix 1.

Also, two screening questions were used at the start of the survey. These were:

1) Frequency of grocery shopping (Respondents were screened out *if they do not go grocery shopping at least once per month*); and
2) Awareness of New Zealand as a country (Respondents were screened out *if they are not aware of New Zealand*).

In order to ensure data quality, some respondents were removed. Respondents were excluded from the final sample if they had completed the survey in a time that is considered insufficient to allow for adequate consideration of questions (i.e. respondents are just clicking through the survey). Insufficient timing that excluded respondents from survey was determined on a survey-by-survey basis and included an evaluation of the distribution of completion times by other respondents.

2.2.2 Survey development

The survey was developed by the research team drawing from an extensive literature review on international consumers trends (Miller et al. 2014), results from previous surveys examining consumers attitudes in overseas markets (Saunders et al. 2011; Guenther et al. 2012; Saunders et al. 2013), a pilot survey (Saunders et al. 2015) and extensive consultation with industry partners and stakeholders.

In particular, the survey was informed by the use of a pilot survey with a sample size of approximately 100 in each of China, India, Indonesia, Japan, Korea and the UK in June 2014, which explored technologies and services that were currently being used by food and beverage consumers in these markets, including the use of online shopping, social media, mobile devices,

as well as their wider integrated uses (e.g. QR codes and microchip scanning technology) with specific relation to food and beverage products (Saunders et al. 2015). From this, an analysis of the key technologies being used in these markets was made, thereby informing the questionnaire design of the final survey. The draft of the final survey questionnaire was then sent to industry partners and stakeholders, providing suggestions and advice on its contents. The final surveys were completed in all five countries in March and April 2015.

The original survey was in English. For the Chinese, Japanese and Indonesian survey the questionnaire was translated into the respective language by a professional translation service and cross-checked by other translators. Consultation was undertaken with people in these markets in order to check the interpretation of specific terms of the key attributes such as animal welfare and environmental condition. This was to assure - as far as - possible that the questions are understood in a similar way in all countries.

2.2.3 Survey structure and implementation

The final survey comprised a range of binary, Likert scale and continuous scale questions to assess consumer attitudes towards and use of a range of digital media and smart technologies. The questionnaire used in this study is attached in Appendix 2. The survey also included a set of questions to assess consumer attitudes towards credence attributes in food and beverages in the surveyed countries, however, as stated earlier, these results are presented in a different report (see Guenther et al. 2015).

Participants were first asked to indicate the frequency at which they used a range of websites (such as social media and food blogs) to search for information about food and beverages. Next, participants were asked to indicate the percentage of their regular shopping that was carried out online, for both food and beverage and other products, and subsequently state their main reasons for shopping for food and beverages online.

Following this, participants were asked to indicate if they had ever used a mobile app to find out more about a food and beverage product, as well as the frequency at which they used their mobile device to purchase food and beverages. Then participants were asked to indicate if they had ever used their mobile device in conjunction with barcodes/QR codes for both the purchase and gathering of information about food and beverage products.

In the next set of questions, participants were asked if they had ever used microchip reading technology (by frequency of use), and to what frequency they used barcodes, QR codes, microchip reading technology and other elements to verify a food and beverage products credentials. Finally, participants were asked to indicate the frequency at which, if these technologies were available to them, they *would* use barcodes, QR codes, microchip reading technology and other elements to verify a food and beverage product’s credentials.

Chapter 3
The use of Digital Media and Smart Technology in Shopping and Information Gathering of Food and Beverages

This chapter presents the results of a study to assess what digital media and smart technology consumers in China, India, Indonesia, Japan and the UK are using to obtain more information about and purchase food and beverage products. Firstly, results relating to the use of particular websites for food and beverage information are presented, followed by consumers' use of online shopping, mobile devices and interactive technologies. The technology referred to includes generic internet use, online shopping, mobile devices, barcodes and QR codes, as well as microchip reading technology such as RFID and NFC.

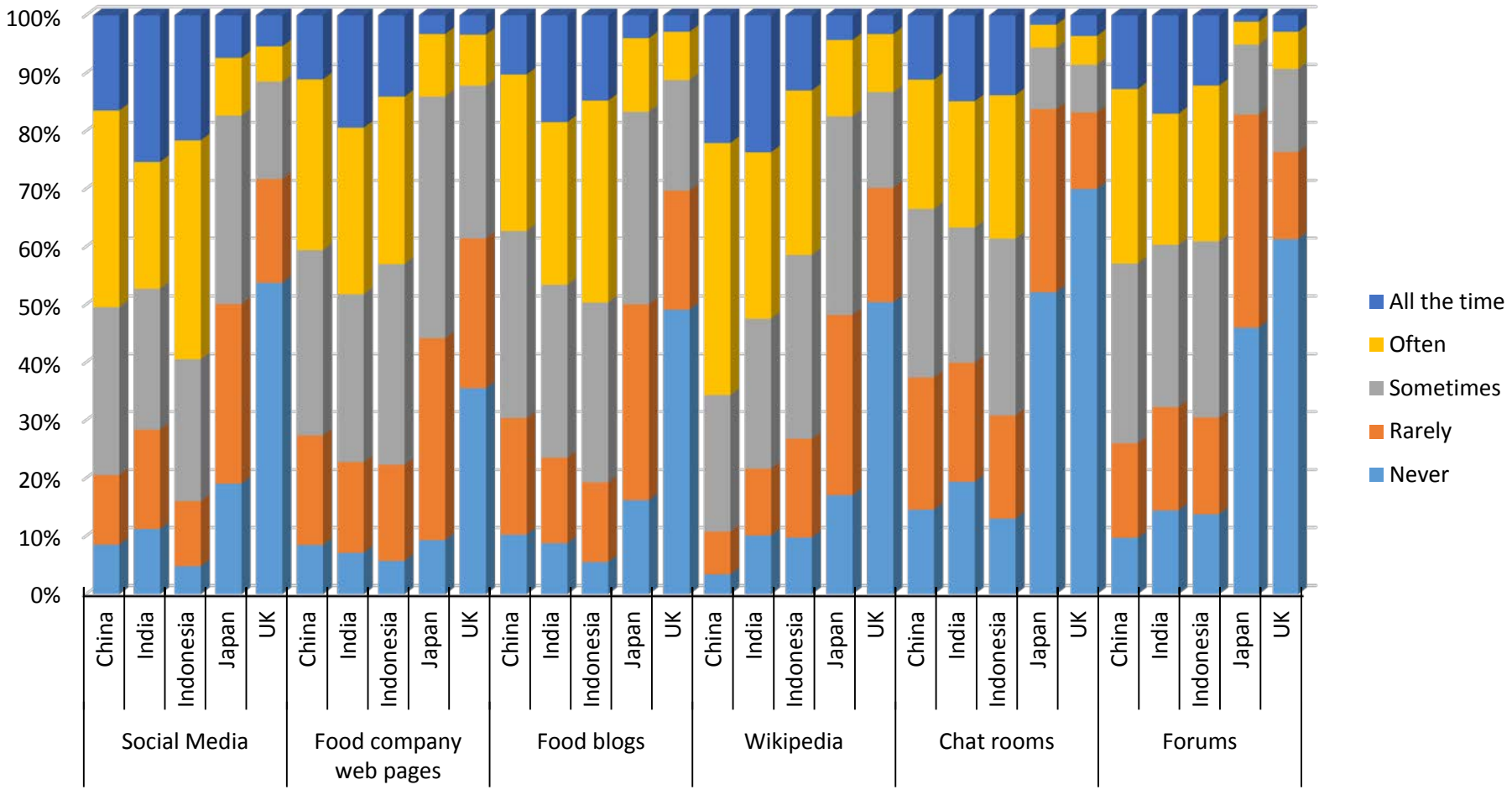
3.1 Website use

Participants were asked to indicate the frequency at which they used specific types of websites to search for information on food and beverages. The question used a five-point Likert scale ranging from *all the time* to *never*. The website types included social media, food company web pages, food blogs, Wikipedia, chat rooms, forums, or other types of websites. Results are shown in Figure 3-1. Overall, it was shown that participants from the developing countries used all website types to search for food and beverage information more frequently than participants from the developed countries.

The highest usage in terms of searching for information on food and beverages that was claimed by participants in all countries was *social media*. In particular, Indonesian participants indicated the highest use of social media sites for this purpose (22 per cent *all the time*, 38 per cent *often*), followed by Chinese (16 per cent *all the time*, 34 per cent *often*) and Indian participants (25 per cent *all the time*, 22 per cent *often*). Similarly, the use of *Wikipedia* to obtain more information on food and beverages was high, with Chinese participants reporting the highest use of this website type (22 per cent *all the time*, 44 per cent *often*), followed by Indian (24 per cent *all the time*, 29 per cent *often*) and Indonesian participants (13 per cent *all the time*, 28 per cent *often*). The use of *food company web pages* in order to obtain more information on food and beverages was high amongst participants in the developing countries, particularly in India (19 per cent *all the time*, 29 per cent *often*) and Indonesia (14 per cent *all the time*, 29 per cent *often*). In contrast, only 3 per cent of UK and Japanese participants each claimed to use *food company web pages all the time* to retrieve more information on food and beverages. *Food blogs* were largely used by Indonesian (15 per cent *all the time*, 35 per cent *often*), Indian (18 per cent *all the time*, 28 per cent *often*) and Chinese participants (10 per cent *all the time*, 27 per cent *often*).

The least popular website types for finding more information on food and beverages among participants in all countries were *chat rooms* and *forums* with the highest uptake for both indicated by Indian participants. In contrast, participants from the UK and China indicated to rarely use these types of websites for finding more information about food and beverages.

Figure 3-1: Website types used to search for information regarding food and beverages

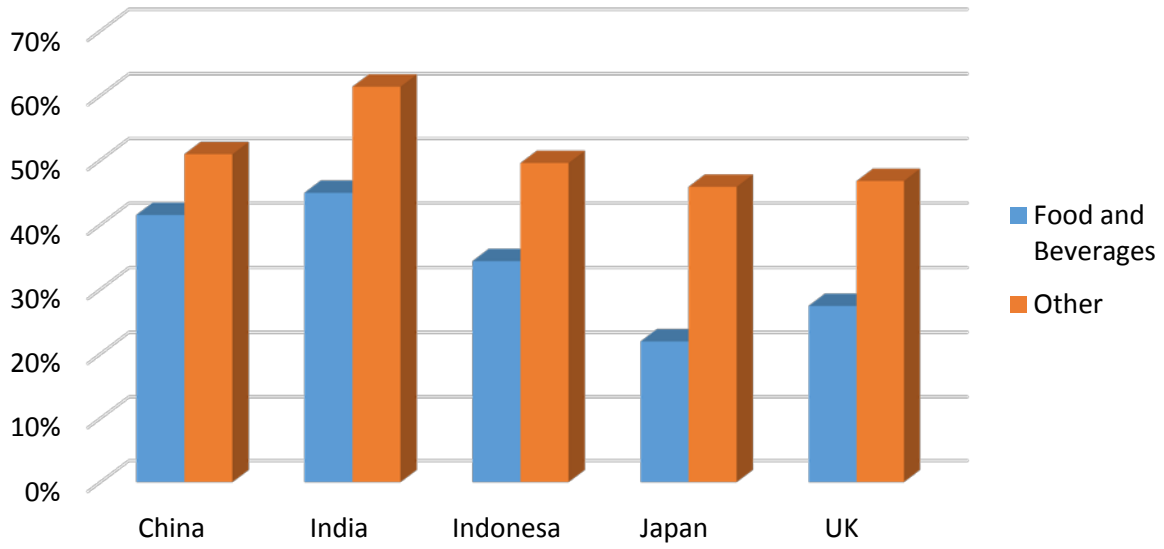


In summary, participants in all countries used all of these websites sometimes. Website use was higher in the developing countries than Japan and the UK. The most popular websites were Wikipedia and social media.

3.2 Online shopping for food and beverages

The survey then included several questions about online shopping. Participants were firstly asked to indicate the proportion of their regular shopping for *food and beverages* and *other* items that was done online. As shown in Figure 3-2, the highest overall percentage of online shopping for food and beverages was reported by Indian respondents, with 45 per cent shopping for food and beverages performed online, followed by Chinese (41 per cent) and Indonesian participants (34 per cent). The lowest percentage of online food shopping was reported by respondents from Japan, at 22 per cent.

Figure 3-2: Percentage of shopping done online, by type



Participants were then asked to indicate their main reasons for shopping online from the following options: that prices are generally lower online; comparisons of food and beverages are easier to make online; the quality of food and beverages is better online; the variety of food and beverages is greater online; the convenience of having products delivered to their house; and the ability to order food and beverages from overseas that are better or not available domestically. The results presented in Figures 3-3 and 3-4.

As shown in Figure 3-3 and Figure 3-4, the majority of participants from the UK and Japan stated that they liked the convenience of having products delivered to their homes at 61 per cent and 45 per cent, respectively. In contrast, the majority of Chinese (29 per cent) and Indian participants (25 per cent) indicated their reason for shopping online is that prices are generally lower. The majority of Indonesian respondents (27 per cent) indicated that comparisons of food and beverages are easier to make online. Another reason for shopping online was to order products from overseas that are better or not available domestically. This was particularly true for participants from Indonesia, China and Japan at 15, 14, and 7 per cent, respectively.

Reasons for using online shopping services varied between countries. Cross-country comparison showed that, for Chinese and Indian participants, generally lower prices online was the top reason for using online shopping. This was followed by a greater variety of food and beverage products and the convenience of having products delivered. Conversely, the ability to make easier comparisons between products online was the top reason for using online shopping as stated by

Indonesian participants, followed by generally lower prices and a greater variety of products available. In contrast, participants from the developed countries of Japan and the UK indicated that the convenience of having products delivered was the top reason for shopping online, followed by generally lower prices and a greater variety of products available online.

Figure 3-3: Reasons for shopping online

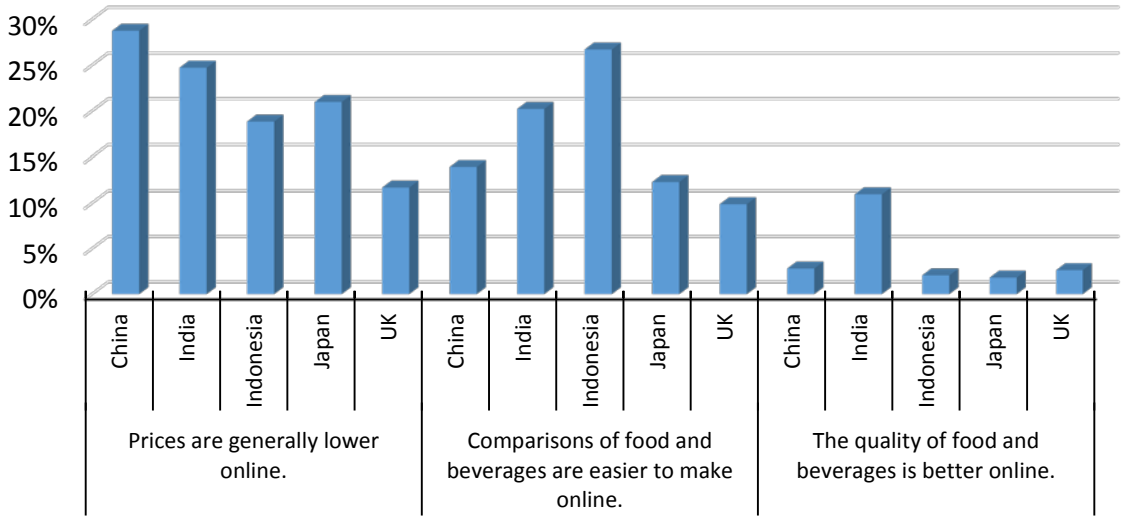
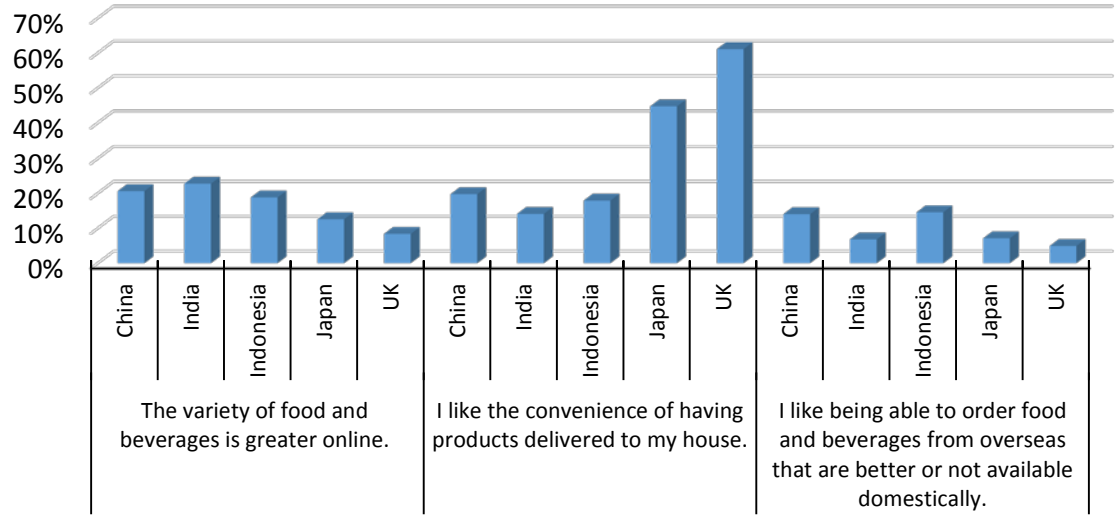


Figure 3-4: Reasons for shopping online

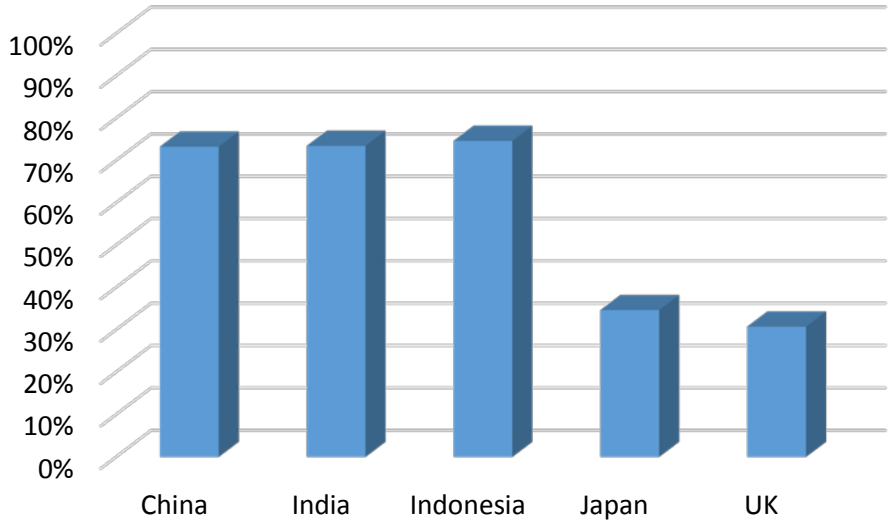


3.3 Consumer use of mobile devices

This study also focused on determining consumer use of smart technology in food and beverage information gathering and purchasing behaviour, notably mobile devices (such as smartphones and tablets). In order to examine the means by which product information could be communicated to consumers in export markets relevant to New Zealand, this survey included questions examining relationships between mobile device use and food and beverage purchasing behaviours.

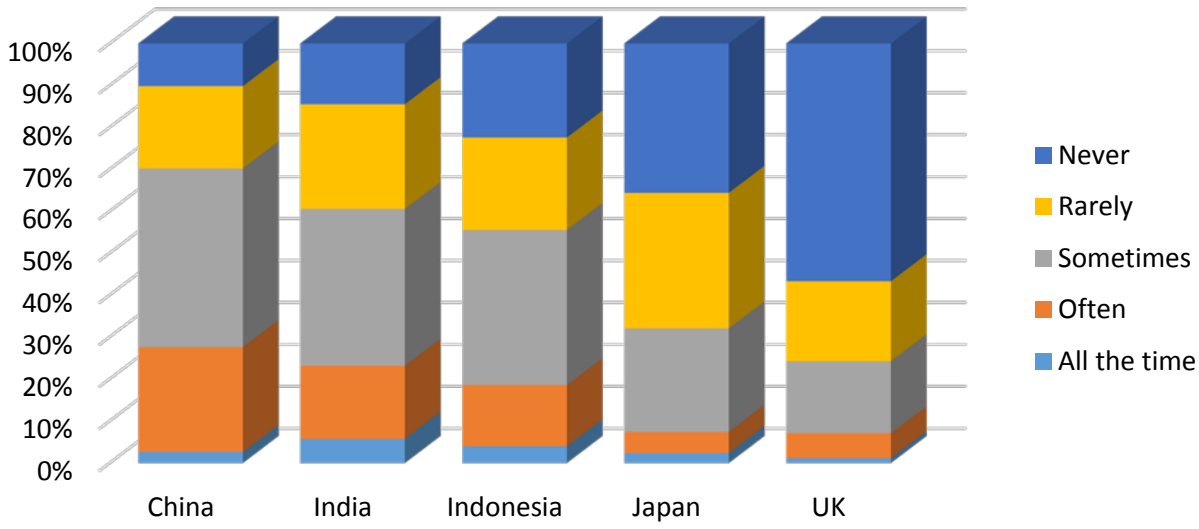
The majority of survey respondents owned a mobile device. When participants were asked to state if they had ever used a mobile app to find out more about food and beverages, results showed a clear distinction between the developing countries and the developed countries (see Figure 3-5). While more than 70 per cent of respondents in each of China, India and Indonesia stated that they have used a mobile app for obtaining more information on food and beverages, only a third of UK and Japanese respondents claimed to have ever used an app for this purpose.

Figure 3-5: Mobile apps used for obtaining information on food and beverages



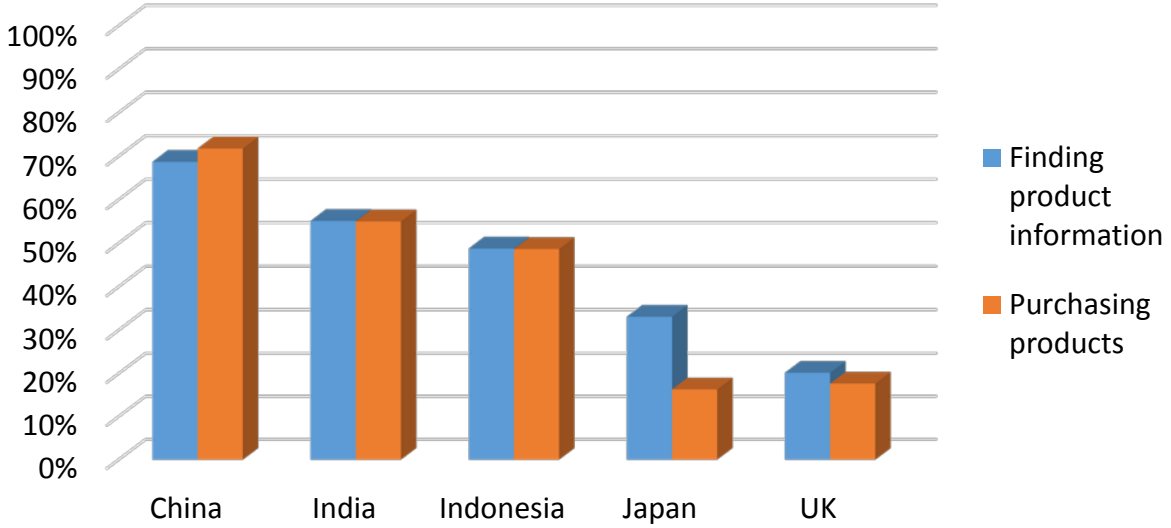
The next question asked participants to indicate on a five-point Likert scale ranging from *all the time* to *never* the frequency of their mobile device usage to purchase food and beverages. As shown in Figure 3-6, participants from China, India and Indonesia indicated an overall higher frequency of use than those from the UK and Japan. The usage of a mobile device for online purchases was particularly frequent in China (25 per cent *often*), followed by India (17 per cent *often*) and Indonesia (15 per cent *often*). Participants from the UK indicated the lowest frequency of use of mobile devices to purchase food and beverage products (57 per cent *never*).

Figure 3-6: Use of mobile devices for purchasing food and beverages online



Then participants were asked if they used their mobile device(s) in conjunction with barcodes and/or QR codes for finding more information about food and beverages. This was particularly true for Chinese (69 per cent) and Indian participants (45 per cent), as shown in Figure 3-7. In contrast, the majority of respondents from the UK and Japan stated they had never used their mobile device in conjunction with barcodes and/or QR codes for the purpose of finding more information about food and beverages.

Figure 3-7: Mobile use in conjunction with barcodes and/or QR codes for searching for information about and purchasing food and beverage products



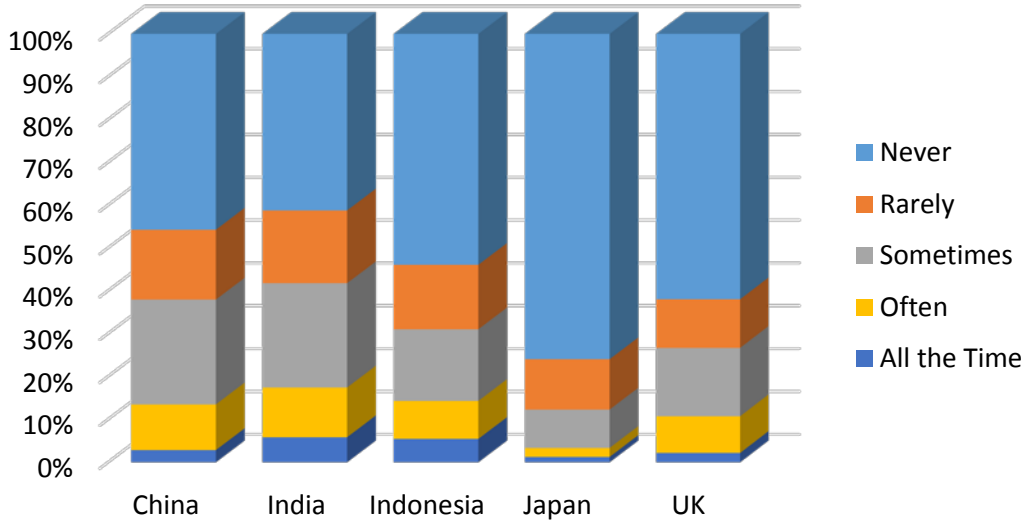
Participants were also asked if they had used their mobile device(s) in conjunction with barcodes and/or QR codes for purchasing food and beverages. As shown in Figure 3-7, the majority of Chinese and Indian participants stated that they have used these for purchasing food and beverages while the majority of Indonesian, UK and Japanese respondents indicated they have not used their mobile devices in conjunction with barcodes and/or QR codes for food and beverage purchasing.

3.4 Interactive technology

The survey then explored the use of different types of technology, including those with a high potential to be used more prominently in the future. One such technology identified to have future potential in food and beverage marketing and sales is that of microchip reading. This includes the most common microchip types of RFID and NFC. These microchip technologies act at proximity with a personal technological device (such as a smartphone), allowing the user to hold their phone over a microchip reader to wirelessly interact with the device. These technologies are already housed within many mobile devices, and can be used for the purposes of displaying food and beverage information on a user's smartphone screen, allowing for the purchase of products directly using a smartphone, as well as many other potential applications.

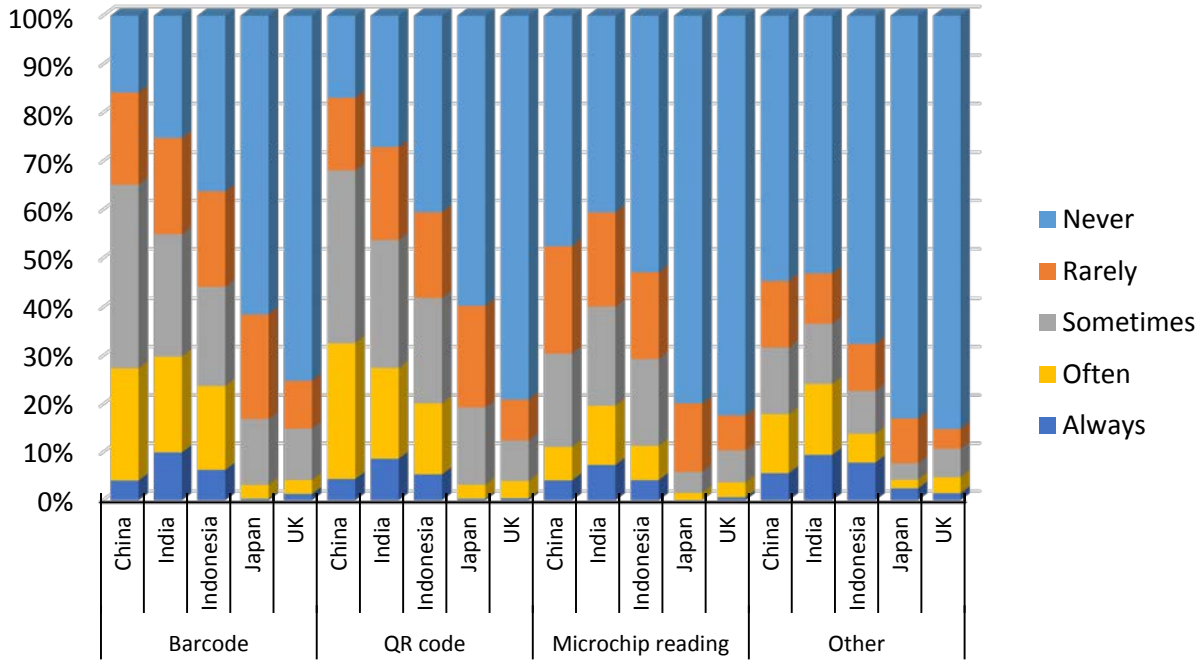
With regards to the frequency of use of microchip reading technology, Figure 3-8 shows that respondents from China, India and Indonesia have used it more frequently than participants from the UK and Japan. Indian participants indicated the highest rates of use (6 per cent *all the time*, 12 per cent *often*), followed by Indonesian (5 per cent *all the time*, 9 per cent *often*) and Chinese participants (3 per cent *all the time*, 11 per cent *often*).

Figure 3-8: Use of microchip reading technology



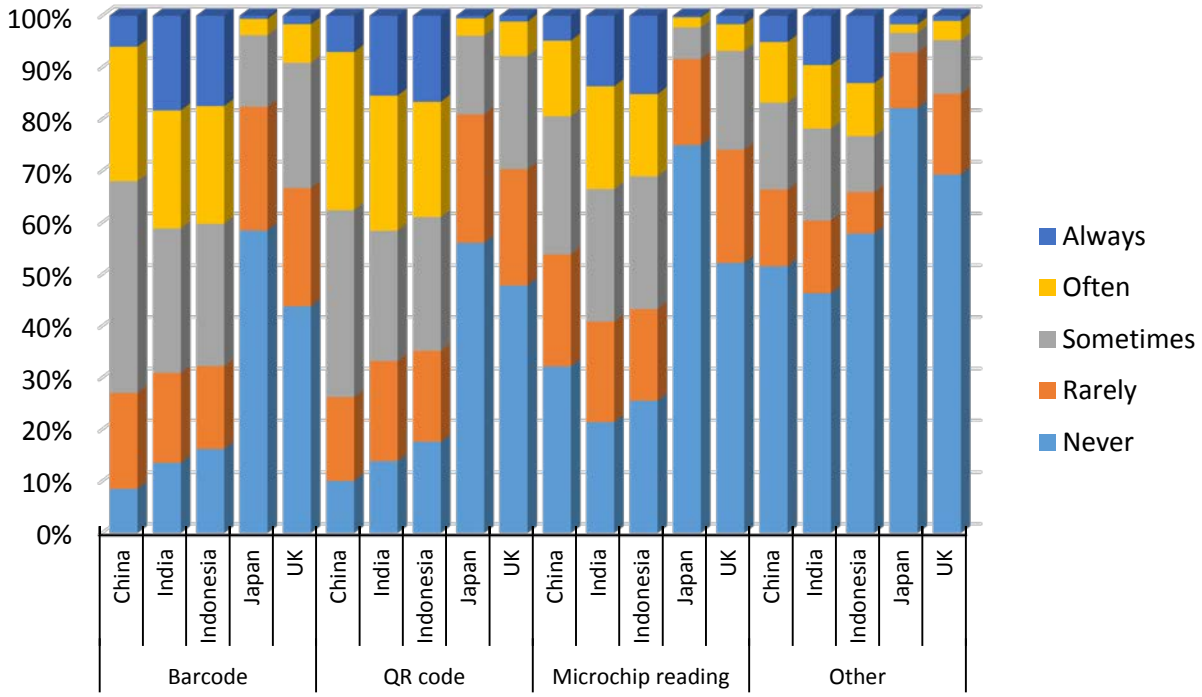
Using a five-point Likert scale ranging from *always* to *never*, participants were asked to indicate the frequency at which they use different types of technology to verify the credentials of food and beverages. The different types included the use of barcodes; QR codes; and microchip reading and technology used in conjunction with their mobile device(s). As shown in Figure 3-9, the greatest use of *barcodes* was shown by Indian participants (10 per cent *always* and 20 per cent *often*). In contrast, the use of *QR codes* for verifying food and beverages' credentials was more popular among Chinese respondents (4 per cent *always* and 28 per cent *often*). The majority of UK and Japanese respondents claimed to have never used a *barcode* (75 per cent *never* and 61 per cent *never* respectively) or *QR code* (79 per cent *never* and 60 per cent *never* respectively) to verify product credentials. The use of *microchip reading* for the credential verification had a lower uptake compared to *QR codes* and *barcodes*. Indian participants indicated the highest frequency of use of this technology, at 7 per cent *always* and 12 per cent *often;* this was followed by Indonesian participants, at 4 per cent *always* and 7 per cent *often.*

Figure 3-9: Verification of food and beverage product credentials via technology, by type



The final question of the survey used the same Likert scale range and asked participants to indicate the frequency at which they *would* use the different types of technology for product verification if they were available. The different types included the use of barcodes, QR codes and microchip reading technology. As shown in Figure 3-10, the intention to use these technologies if available is positive across all countries, with a more frequent intention indicated by participants from Indonesia, India and China than from the UK and Japan. In particular, the intended use of barcodes and QR codes was high in India and Indonesia with more than 15 per cent of participants indicating that they would use either of them *always* for verification of credentials of food and beverages if available. Results on respondents' intentions to use *microchip reading technology* if available showed a lower intended uptake by participants across all countries, with the highest intention to use signalled by Indian (14 per cent *always*, 20 per cent *often*) and Indonesian participants (15 per cent *always*, 16 per cent *often*). The majority of Japanese and UK respondents indicated that they had no intention to use *microchip reading technology* for the verification of credentials of food and beverages if available.

Figure 3-10: Intention to verify food and beverage product credentials via technology



In summary, the results presented in this chapter showed that while all technologies are used in all countries, rates of engagement were observed to be generally higher for participants in the developing countries of China, India and Indonesia over their developed country counterparts.

A possible effect of this may be that participants in Japan and the UK were slightly older than those of their developing country counterparts, with the highest-represented age group for both countries at 45-64 years old. Specifically for Japan, while it is a country built on its technology development and exports, domestic uptake has been found to be much slower, with Japanese consumers still using many outdated technologies by world standards (Fitzpatrick 2015).

Another possible cause of a higher usage rate amongst developing country participants is a high degree of investment in the development of internet infrastructure in these countries. Such recent developments include Google's establishment of a wireless internet-distributing weather-balloon system to be deployed over the Indonesian archipelago (Adhikari 2015), as well as the installation of free Wi-Fi at approximately 400 train stations throughout India (Musil 2015).

Chapter 4
Conclusion

New Zealand is a developed country which is dependent on its agricultural exports. While the UK historically received the greatest share of New Zealand's exports (until 1960), focus has been placed on Asian markets for New Zealand exports over the last few decades. This includes both developed and emerging market economies, including China, India, Indonesia and Japan. Furthermore, due to the wide diversity of these markets, it is important for exporters to understand mainstream means of product communication currently being used in these markets. As the use of such digital communication and commerce tools as online shopping, social media and mobile devices grows internationally, agribusiness supply chain managers should both understand and consider their use as essential to the development of effective digital marketing and sales strategies.

This study included a survey conducted with a sample size of 1,000 each in the markets of UK, Japan, China, Indonesia and India to assess the use of digital media and smart technologies by food and beverage consumers in these markets. Overall, results demonstrate that participants in all countries are engaging with technology in relation to food and beverage information finding and purchasing, and that these technologies are being used in this way more frequently and intensely by consumers in the developing countries.

Results showed that Wikipedia and social media were indicated as the most popular sources of food and beverage information online. Indian consumers are the most frequent users of almost all website types considered, and UK consumers are the lowest, by a considerable margin.

Participants across all countries indicated that they shop for food and beverages online. While India reported the highest rate of online food and beverage shopping, Japan had the lowest, and developing countries consumers overall conducted more of their food and beverage shopping online compared with developed economy counterparts. For the majority of consumers surveyed, the main reason for shopping online is the convenience of delivery (particularly for developed country consumers). In addition, Chinese and Indian participants indicated lower prices were the most important reason, while Indonesian participants indicated that easy comparisons between products online are the main reason for using these services.

Seventy per cent of consumers across countries used mobile apps to find food and beverage related information. Indonesian consumers were the highest users of mobile apps to find food and beverage information at almost 75 per cent of respondents, and Indian and Chinese consumers were only marginally lower. Noticeably, Japanese and UK use of this was significantly lower.

The frequency of food and beverages purchases using mobile devices was significantly lower than that for information searching across all countries. Chinese consumers' were the only group who frequently used their mobile device to purchase food and beverage products (*all the time/often*) at 25 per cent of respondents. The remaining countries were all below 20 per cent (*all the time/often*), with Japan and the UK the lowest at 7 per cent (*all the time/often*). The frequency of QR code use for food information was relatively high across all countries except in Japan and the UK.

The use of microchip reading technology by participants varied between countries, with Indian participants indicating the highest use of this, followed by Indonesian and Chinese participants. For the verification of food and beverage product credentials, barcodes and microchip reading technology were used most frequently by Indian participants, while QR codes were most frequently used by Chinese participants, as well as microchip reading technology. As for the intention to use these technologies for food and beverage product credential verification in the

future (if available), barcodes and QR codes were most favoured by Indonesian consumers, with microchip reading technology most favoured by Indian consumers.

To concluce, differences in technology use by consumers in overseas markets relevant to New Zealand are important to consider by those in New Zealand's food and beverage marketing, sales and export positions. This study implies that successful consumer engagement requires a coordinated strategy targeting channels specific to each country's consumers' preferences. This information is also valuable in its demonstration of consumer technology use in developing countries – an increasing area of focus for New Zealand's export-driven producers.

References

Adhikari, R. (2015). Google Migrates Project Loon to Indonesia. Accessed 5th November 2015 from http://www.technewsworld.com/story/82683.html.

Baker, R. and Göritz, A.S. (2014). Introduction to Part VI: Special domains. In M. Callegaro, R. Baker, J. Bethlehem, A.S. Göritz, J.A. Krosnick and P.J. Lavrakas (Eds.) *Online Panel Research: A Data Quality Perspective* (1st Ed.) (pp. 363-365).

Callegaro, M., Baker, R., Bethlehem, J., Göritz, A.S., Krosnick, J.A. and Lavrakas, P.J. (2014a). Online panel research History, concepts, applications and a look at the future. In M. Callegaro, R. Baker, J. Bethlehem, A.S. Göritz, J.A. Krosnick and P.J. Lavrakas (Eds.) *Online Panel Research: A Data Quality Perspective* (1st Ed.) (pp. 1-22). DOI: 10.1002/9781118763520.ch1

Callegaro, M., Villar, A., Yeager, D. and Krosnick, J.A. (2014b). A critical review of studies investigating the quality of data obtained with online panels based on probability and nonprobability samples. In M. Callegaro, R. Baker, J. Bethlehem, A.S. Göritz, J.A. Krosnick and P.J. Lavrakas (Eds.) *Online Panel Research: A Data Quality Perspective* (1st Ed.) (pp. 23-53). DOI: 10.1002/9781118763520.ch2

Callegaro, M. and Krosnick, J.A. (2014). Introduction to Part I: Coverage. In M. Callegaro, R. Baker, J. Bethlehem, A.S. Göritz, J.A. Krosnick and P.J. Lavrakas (Eds.) *Online Panel Research: A Data Quality Perspective* (1st Ed.) (pp. 55-60). DOI: 10.1002/9781118763520.part1

Dillman, D.A., Smyth, J.D. and Christian, L.M. (2009). Internet, mail, and mixed-mode surveys: The tailored design method (3rd ed.). Hoboken NJ: John Wiley & Sons, Inc.

Dvorak, P., Mozur, P., Osawa, J., Back, A., Kim, Y-H., Huang, M. … Chow, J. (2014). What is Alibaba? Accessed 3rd October 2014 from http://projects.wsj.com/alibaba/.

Ebling, M. (2010). Bar Codes Everywhere You Look. *Pervasive Computing*, April-June 2010: pg. 4-5.

eMarketer (2013). Social networking reaches nearly one in four around the world. Accessed 18th October 2014 from http://www.emarketer.com/Article/Social-Networking-Reaches-Nearly-One-Four-Around-World/1009976.

eMarketer (2014a). Global B2C Ecommerce Sales to Hit $1.5 Trillion This Year Driven by Growth in Emerging Markets. Accessed 3rd October 2014 from http://www.emarketer.com/Article/Global-B2C-Ecommerce-Sales-Hit-15-Trillion-This-Year-Driven-by-Growth-Emerging-Markets/1010575.

eMarketer (2014b). Worldwide Ecommerce Sales to Increase Nearly 20% in 2014. Accessed 3rd October 2014 from http://www.emarketer.com/Article/Worldwide-Ecommerce-Sales-Increase-Nearly-20-2014/1011039.

Experian (2013). Experian Marketing Services Reveals 27 Percent of Time Spent Online is on Social Networking. Retrieved 28th September 2014 from http://press.experian.com/United-States/Press-Release/experian-marketing-services-reveals-27-percent-of-time-spent-online-is-on-social-networking.aspx.

Facebook (2015). Facebook Reports First Quarter 2015 Results. Accessed 28th July 2015 from http://investor.fb.com/releasedetail.cfm?ReleaseID=908022.

Fitzpatrick, M. (2015). Why is hi-tech Japan using cassette tapes and faxes? Accessed 5th November 2015 from http://www.bbc.com/news/business-34667380.

Guenther, M., Saunders, C. and Tait, P. (2012). Carbon labelling and consumer attitudes. Carbon Management Journal; 3(5), pp. 445-455.

Guenther, M., Saunders, C., Dalziel, P., Rutherford, P., Driver, T. (2015). Maximising Export Returns: Consumer attitudes towards attributes of food and beverages in developed and emerging export markets relevant to New Zealand. AERU Research Report No. 336. Agribusiness and Economics Research Unit, Lincoln University; Lincoln, New Zealand.

Hillygus, D.S., Jackson, N. and Young, M. (2014). Professional respondents in nonprobability online panels. In M. Callegaro, R. Baker, J. Bethlehem, A.S. Göritz, J.A. Krosnick and P.J. Lavrakas (Eds.) *Online Panel Research: A Data Quality Perspective* (1st Ed.) (pp. 219-237). DOI: 10.1002/9781118763520.ch10

International Telecommunication Union (ITU) (2015). Key ICT indicators for the world. Retrieved 28th July 2014 from http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2015/ITU_Key_2005-2015_ICT_data.xls.

Madrigal, A.C. (2014). Goldman: There Will Be as Much Mobile Commerce in 2018 as E-Commerce in 2013. Accessed 28th July 2015 from http://www.theatlantic.com/technology/archive/2014/03/goldman-there-will-be-as-much-mobile-commerce-in-2018-as-br-e-commerce-in-2013/284270/.

Miller, S., Driver, T., Velasquez, N. and Saunders, C. (2014). Maximising Export Returns (MER): Consumer behaviour and trends for credence attributes in key markets and a review of how these may be communicated. AERU Research Report No. 332, July 2014. Retrieved 28th July 2015 from http://www.lincoln.ac.nz/AERU/MER.

Ministry of Foreign Affairs and Trade (MFAT). (2013). *New Zealand-India Free Trade Agreement*. Retrieved from http://www.mfat.govt.nz/Trade-and-Economic-Relations/2-Trade-Relationships-and-Agreements/India/

Ministry of Foreign Affairs and Trade (MFAT). (2014). ASEAN, Australia and New Zealand Free Trade Agreement. Retrieved from http://www.mfat.govt.nz/Trade-and-Economic-Relations/2-Trade-Relationships-and-Agreements/Asean/index.php

Musil, S. (2015). Google to install free Wi-Fi at 400 railway stations in India. Accessed 5th November 2015 from http://www.cnet.com/news/google-to-install-free-wi-fi-at-400-railway-stations-in-india/ .

Rao, L. (2015). Alibaba Rings Up a Record $14.3 Billion in Sales for Singles Day. Accessed 3rd December 2015 from http://fortune.com/2015/11/11/alibaba-singlesday-record-2015/.

Saunders, C., Guenther, M., Tait, P., Kaye-Blake, W., Saunders, J.T., Miller, S. and Abell, W. (2011). Consumer attitudes towards sustainability attributes on food labels in the United Kingdom and Japan. Proceedings of the 85th Annual Conference of the Agricultural Economics Society, University of Warwick, United Kingdom, 18-20 April 2011. Banbury, UK: Agricultural Economics Society.

Saunders, C., Guenther, M., Tait, P. and Saunders, J. (2013). Assessing consumer preferences and willingness to pay for NZ food attributes in China, India and the UK. Proceedings of the 87th Annual Conference of the Agricultural Economics Society, University of Warwick, United Kingdom, 8-10 April 2013. Banbury, UK: Agricultural Economics Society.

Saunders, C., Guenther, M., Driver, T., Tait, P., Dalziel, P. and Rutherford, P. (2015). Consumer Attitudes to Food Product Attributes and Technology Use in Key International Markets. AERU Research Report No. 333, May 2015. Retrieved 28th July 2015 from http://www.lincoln.ac.nz/AERU/MER.

Simcott, R. (2014). Social Media Fast Facts: China. Retrieved 28th September 2014 from http://socialmediatoday.com/richard-simcott/2213841/social-media-fast-facts-china.

Statista (2015a). B2C e-commerce sales worldwide from 2012 to 2018 (in billion U.S. dollars). Accessed 28th July 2015 from http://www.statista.com/statistics/261245/b2c-e-commerce-sales-worldwide/.

Statista (2015b). Statistics and facts about online shopping behavior. Accessed 28th July 2015 from http://www.statista.com/topics/2477/online-shopping-behavior/.

Statista (2015c). M-commerce retail revenue in the United Kingdom (UK) from 2011 to 2018, by device (in billion GBP). Accessed 28th July 2015 from http://www.statista.com/statistics/285665/m-commerce-retail-revenue-in-the-united-kingdom-uk-by-device/.

Statista (2015d). B2C m-commerce sales in the United States from 2012 to 2018 (in billion U.S. dollars). Accessed 28th July 2015 from http://www.statista.com/statistics/298940/us-b2c-m-commerce-sales/.

Statistics New Zealand (2014). *Global New Zealand - International Trade, Investment, and Travel Profile: Year ended June 2014.* Wellington: Statistics New Zealand.

Tourangeau, R., Conrad, F.G. and Couper, M. (2013). *The science of web surveys*. Oxford University Press: New York.

Wessels, B. (2013).The reproduction and reconfiguration of inequality: Differentiation and class, status and power in the dynamics of digital divides. In M. Ragnedda and G.W. Muschert (Eds.) *The digital dive: The internet and social inequality in international perspective* (pp.17-28). Routledge: London.

Appendix 1
Demographics

Table A1-1. Summary demographics of survey participants, in per cent

	China	India	Indonesia	Japan	UK
Gender					
Female	50%	32%	42%	52%	57%
Male	50%	68%	58%	48%	43%
Age					
16-29	25%	47%	40%	8%	12%
30-44	58%	43%	50%	40%	37%
45-64	17%	9%	11%	47%	46%
65-75+	0%	1%	0%	6%	5%
Household Make-up					
With children	76%	49%	61%	59%	58%
No children	23%	48%	36%	40%	39%
Education					
Up to High School	4%	3%	15%	20%	12%
Tertiary qualification (below degree)	16%	3%	14%	19%	11%
University degree or higher	80%	93%	71%	61%	77%

Table A1-2. Income distribution in per cent in the surveyed

China	
Less than ¥85,000	0%
¥85,000 to ¥94,999	16%
¥95,000 to ¥99,999	14%
¥100,000 to ¥149,999	28%
¥150,000 to ¥199,999	16%
¥200,000 to ¥249,999	12%
¥250,000 or above	14%
India	
Less than Rs 260,000	0%
Rs 260,000 to Rs 299,999	17%
Rs 300,000 to Rs 339,999	17%
Rs 340,000 to Rs 379,999	12%
Rs 380,000 to Rs 419,999	15%
Rs 420,000 to Rs 459,999	13%
Rs 460,000 to Rs 499,999	13%
Rs 500,000 or more	12%
Indonesia	
Less than Rp20 million	0%
Rp20 million to Rp25 million	42%
Rp25 million or more	58%
Japan	
500 million yen or less	20%
500 million yen to 799 million yen	30%
800 million yen to 1,099 million yen	30%
1,100 million yen to 1,399 million yen	13%
1,400 million yen or above	7%
United Kingdom	
Less than £79,999	0%
£80,000 to £89,999	30%
£90,000 to £99,999	29%
£100,000 to £149,999	29%
£150,000 to £199,999	6%
£200,000 to £499,999	4%
£500,000 or more	3%

Appendix 2
Survey Questionnaire

Welcome to this survey about consumer preferences for food and other product attributes. The purpose of this research is to understand which attributes consumers in overseas markets consider important in their product choices. The research is funded by the New Zealand Ministry of Business, Innovation and Employment (MBIE).

The survey is an on-line questionnaire that takes about 15 minutes. You do not have to participate. You have the right to decline to answer any question or stop the survey at any time. If you do stop the survey before the end, the information you have provided will be destroyed.

This survey is being conducted by the Agribusiness and Economics Research Unit at Lincoln University in New Zealand. Data will be held on a secure server on the University campus. The survey does not collect identifying information, and your responses cannot be linked to you. The survey has been reviewed and approved by the Lincoln University Human Ethics Committee. The results of the research may be published.

The lead researcher is Dr Peter Tait, and his manager is Prof Caroline Saunders. If you have any questions or concerns about the research, you may contact them at:

Peter Tait	0064 3 423 0384	peter.tait@lincoln.ac.nz
Caroline Saunders	0064 3 423 0382	caroline.saunders@lincoln.ac.nz

Completion of the survey will be taken as your consent to participate in this research. If at any time, before completing the survey, you wish to withdraw from the survey simply close your browser window. If you complete and submit the survey, you will not be able to withdraw your information at a later date. This means that your anonymity will be preserved at all times.

If at any time you wish to withdraw from the survey simply close your browser window.

To begin the survey, click the >> button below.

Yours sincerely, Dr. Peter Tait

Are you aware of the country New Zealand?

- ❍ Yes
- ❍ No

How often do you go grocery shopping?

- ❍ Daily
- ❍ Weekly
- ❍ Fortnightly
- ❍ Monthly
- ❍ Less than once a month

Please indicate your gross household income before taxes over the past 12 months:

- ❍ Less than £79,999
- ❍ £80,000 - £89,999
- ❍ £90,000 - £99,999
- ❍ £100,000 - £149,999
- ❍ £150,000 - £199,999
- ❍ £200,000 - £499,999
- ❍ £500,000 or more
- ❍ Prefer not to answer

How **important** do you think the following **attributes** are when shopping for food and beverages? Please indicate the level of importance by selecting the relevant circles.

	Very important	Important	Neutral	Unimportant	Not at all important	Don't know
Quality	❍	❍	❍	❍	❍	❍
Price	❍	❍	❍	❍	❍	❍
Animal health	❍	❍	❍	❍	❍	❍
Animal welfare	❍	❍	❍	❍	❍	❍
Environmental condition	❍	❍	❍	❍	❍	❍
Health enhancing foods	❍	❍	❍	❍	❍	❍
Food safety	❍	❍	❍	❍	❍	❍
Social responsibility	❍	❍	❍	❍	❍	❍
Nutritional value	❍	❍	❍	❍	❍	❍
Traditional cultures	❍	❍	❍	❍	❍	❍

Considering the **authentication** of attributes in food and beverages, how important do you think the following are?

	Very important	Important	Neutral	Unimportant	Not at all important	Don't know
Your country's government certification	❍	❍	❍	❍	❍	❍
Other government certification	❍	❍	❍	❍	❍	❍
Independent private certification	❍	❍	❍	❍	❍	❍
Globally recognised certification	❍	❍	❍	❍	❍	❍
Brand	❍	❍	❍	❍	❍	❍
Company	❍	❍	❍	❍	❍	❍
Retailer	❍	❍	❍	❍	❍	❍
Country of origin	❍	❍	❍	❍	❍	❍

Considering **safety in food and beverages supply**, how important are the following factors?

	Very important	Important	Neutral	Unimportant	Not at all important	Don't know
Hygiene standards	❍	❍	❍	❍	❍	❍
Rates of contamination	❍	❍	❍	❍	❍	❍
Reduced use of pesticides	❍	❍	❍	❍	❍	❍
Environmental condition	❍	❍	❍	❍	❍	❍
Freshness	❍	❍	❍	❍	❍	❍
Animal health	❍	❍	❍	❍	❍	❍
Animal welfare	❍	❍	❍	❍	❍	❍
Labelling of "Use by date"	❍	❍	❍	❍	❍	❍
Traceability to origin	❍	❍	❍	❍	❍	❍
Trust in supply chain	❍	❍	❍	❍	❍	❍
GM-free food	❍	❍	❍	❍	❍	❍
Tamper proof packaging	❍	❍	❍	❍	❍	❍

Considering **environmental condition in food and beverages supply**, how important are the following factors?

	Very important	Important	Neutral	Unimportant	Not at all important	Don't know
Air quality	❍	❍	❍	❍	❍	❍
Water quality	❍	❍	❍	❍	❍	❍
Organic production	❍	❍	❍	❍	❍	❍
Greenhouse gas emissions	❍	❍	❍	❍	❍	❍
Protecting endangered plants and animals	❍	❍	❍	❍	❍	❍
Protecting biodiversity	❍	❍	❍	❍	❍	❍
Protecting wetlands	❍	❍	❍	❍	❍	❍
Protecting coastal and sea-life	❍	❍	❍	❍	❍	❍
Wilderness	❍	❍	❍	❍	❍	❍
Recycling	❍	❍	❍	❍	❍	❍
Open spaces	❍	❍	❍	❍	❍	❍

Considering **animal welfare & health in food and beverages supply**, how important are the following factors?

	Very important	Important	Neutral	Unimportant	Not at all important	Don't know
Good quality of life	❍	❍	❍	❍	❍	❍
Good shelter and living conditions	❍	❍	❍	❍	❍	❍
GM-free feed	❍	❍	❍	❍	❍	❍
Animals are well-fed	❍	❍	❍	❍	❍	❍
Humane slaughter	❍	❍	❍	❍	❍	❍
No cruelty	❍	❍	❍	❍	❍	❍
Natural conditions	❍	❍	❍	❍	❍	❍
Free of disease	❍	❍	❍	❍	❍	❍
Welfare veterinary plan	❍	❍	❍	❍	❍	❍
Free range	❍	❍	❍	❍	❍	❍
Mainly pasture fed	❍	❍	❍	❍	❍	❍
Sustainably sourced inputs, especially feed	❍	❍	❍	❍	❍	❍

Considering human **health enhancing foods**, how important are the following factors?

	Very important	Important	Neutral	Unimportant	Not at all important	Don't know
Energy and endurance	❍	❍	❍	❍	❍	❍
Weight management	❍	❍	❍	❍	❍	❍
Digestive health	❍	❍	❍	❍	❍	❍
Heart and cholesterol health	❍	❍	❍	❍	❍	❍
Blood nutrients	❍	❍	❍	❍	❍	❍
Mobility	❍	❍	❍	❍	❍	❍
Immune system	❍	❍	❍	❍	❍	❍
Skin health	❍	❍	❍	❍	❍	❍
Child health	❍	❍	❍	❍	❍	❍
Baby health	❍	❍	❍	❍	❍	❍
Bone health	❍	❍	❍	❍	❍	❍
Memory/ Brain health	❍	❍	❍	❍	❍	❍

Considering **social responsibility in food and beverages supply**, how important are the following factors?

	Very important	Important	Neutral	Unimportant	Not at all important	Don't know
Fair wages	❍	❍	❍	❍	❍	❍
Good working conditions	❍	❍	❍	❍	❍	❍
Freedom to join a trade union or other associations	❍	❍	❍	❍	❍	❍
Investment of profits in community facilities	❍	❍	❍	❍	❍	❍
Fair Trade	❍	❍	❍	❍	❍	❍
Paid annual leave	❍	❍	❍	❍	❍	❍
Freedom from discrimination	❍	❍	❍	❍	❍	❍
Workplace safety	❍	❍	❍	❍	❍	❍
Equity	❍	❍	❍	❍	❍	❍
No child labour	❍	❍	❍	❍	❍	❍
Local food	❍	❍	❍	❍	❍	❍

Considering the role of **traditional cultures in food and beverages supply**, how important are the following factors?

	Very important	Important	Neutral	Unimportant	Not at all important	Don't know
Equity & fairness	❍	❍	❍	❍	❍	❍
Native/ indigenous values	❍	❍	❍	❍	❍	❍
Cultural values	❍	❍	❍	❍	❍	❍
Connection with natural environment	❍	❍	❍	❍	❍	❍
Family business	❍	❍	❍	❍	❍	❍
Indigenous rights	❍	❍	❍	❍	❍	❍
Traditional wisdom & knowledge	❍	❍	❍	❍	❍	❍
Traditional production processes	❍	❍	❍	❍	❍	❍
Care for future generations	❍	❍	❍	❍	❍	❍
Traditional healing and medicine	❍	❍	❍	❍	❍	❍

Overall, how do you rank food and beverages from these countries? Please indicate your ranking. Please indicate your ranking by dragging and dropping each country/ or country group into the box in your preferred ranking.

Europe

New Zealand

Australia

North America

My own country

South America

Drag countries here to indicate your ranking

How much do you associate the following factors with New Zealand?

	Strongly	Moderately	A little	Not at all	Don't know
Open spaces and wilderness	❍	❍	❍	❍	❍
Quality products	❍	❍	❍	❍	❍
Food safety	❍	❍	❍	❍	❍
Integrity	❍	❍	❍	❍	❍
Innovative	❍	❍	❍	❍	❍
Clean water	❍	❍	❍	❍	❍
Natural farming methods	❍	❍	❍	❍	❍
Clean environment	❍	❍	❍	❍	❍

The next questions are about the food and beverage products you usually purchase.

Which products do you usually purchase? Please select all that apply.

	Which products do you usually purchase?		**Which New Zealand products do you usually purchase?**		
	Yes	No	Yes	No	Don't know
Cheese	❍	❍	❍	❍	❍
Butter	❍	❍	❍	❍	❍
Milk powder	❍	❍	❍	❍	❍
Infant formula	❍	❍	❍	❍	❍
Liquid milk	❍	❍	❍	❍	❍
Other dairy	❍	❍	❍	❍	❍
Beef	❍	❍	❍	❍	❍
Lamb	❍	❍	❍	❍	❍
Other meat	❍	❍	❍	❍	❍
Confectionary	❍	❍	❍	❍	❍
Kiwifruit	❍	❍	❍	❍	❍
Apples	❍	❍	❍	❍	❍
Other fruit	❍	❍	❍	❍	❍
Vegetables	❍	❍	❍	❍	❍
Honey	❍	❍	❍	❍	❍
Fish/ Seafood	❍	❍	❍	❍	❍
Wine	❍	❍	❍	❍	❍

The levels of food and beverages **attributes** can be broadly ranked into three categories: **minimum**, **improved**, and **high**. Thinking about the food and beverage products you normally purchase, how would you rank them? Please use the drop down lists in the table below to rank your normal purchases.

Health enhancing benefits: These attributes are beneficial to adult and children's health, such as digestive, heart, bone and joint health. These health effects can range from short to long term. More info

Environmental condition: Foodstuffs can have different environmental impacts during production and in the supply chain. Possible impacts include harm to air and water quality, as well as pressures on wilderness and endangered animals and plants. More info

Animal welfare: The way animals are treated can impact both their living and health conditions. Minimum standard conditions are monitored and certified by Governments, including effects on off-farm animals, such as birds and wildlife. More info

Food safety: Food safety can be characterised by hygiene standards in production and knowledge of rates of product contamination. Minimum standard conditions are monitored and certified by Governments. More info

Social responsibility: This attribute describes societal elements of production, including avoidance of child labour, paying fair wages, and providing safe working conditions. More info

Quality: This is represented by product elements which you normally use when buying products such as the use-by-date and product brand. More info

	Meat products	Dairy products	Fruit and Vegetable	Wine
Health enhancing benefits	Minimum	Improved		
Environmental condition	Improved			
Animal welfare	High			
Food safety				
Social responsibility				
Quality				

Comparing Food Products

The next group of questions asks you to make choices between three products.

One of the products is a product you normally buy. The other two differ from this in terms of the following attributes: health enhancing benefits, environmental condition, animal health and welfare, food safety, social responsibility, and quality. Otherwise products are no different from what they are now. For each question, please choose which of the three products you prefer.

Each product will have a high, medium or low level of each of these attributes:

Health enhancing benefits: These attributes are beneficial to adult and children's health, such as digestive, heart, bone and joint health. These health effects can range from short to long term.

Level of health benefits delivered by the product	
Minimum	Normal levels of health benefits for this type of product
Improved	Levels of health benefits that are above normal levels
High	High levels of health benefit for this product type

Environmental condition: Foodstuffs can have different environmental impacts during production and in the supply chain. Possible impacts include harm to air and water quality, as well as pressures on wilderness and endangered animals and plants.

Level of environmental protection achieved by the product	
Minimum	Minimum effort has been taken to reduce environmental impacts
Improved	Some efforts have been taken to reduce environmental impacts
High	Significant efforts have been taken to reduce environmental impacts

Animal welfare: The way animals are treated can impact both their living and health conditions. Minimum standard conditions are monitored and certified by Governments, including effects on off-farm animals, such as birds and wildlife.

Level of animal welfare achieved by the product	
Minimum	Minimum requirements are achieved for this type of product
Improved	Levels of animal welfare are above minimum requirements
High	High levels of animal welfare are achieved for this product type

Food Safety: Food safety can be characterised by hygiene standards in production and knowledge of rates of product contamination. Minimum standard conditions are monitored and certified by Governments.

Level of the product's food safety	
Minimum	Minimum requirements are achieved for this type of product
Improved	Levels of food safety are above minimum requirements
High	High levels of food safety are achieved for this product type

Social responsibility: This attribute describes societal elements of production, including avoidance of child labour, paying fair wages, and providing safe working conditions.

Level of social responsibility delivered by the product	
Minimum	Minimum requirements are achieved for this type of product
Improved	Levels of social responsibility are above minimum requirements
High	High levels of social responsibility are achieved for this product type

Quality: This is represented by product elements which you normally use when buying products such as the use-by-date and product brand.

Level of the product's quality	
Minimum	Basic quality for this type of product
Improved	Improved quality for this type of product
High	High quality for this type of product

Price: Change in your normal food and beverage costs. Depending on your product choice, there may be an increase in price to produce this product.

Please consider how the price of the product would fit in your grocery budget.

Click the >> button to continue.

Choice Experiments

Set 1 of 2

Each column describes a different **meat product**. Which of the following meat products would you prefer? Select your choice then click the >> below.

	Standard Meat product	Meat Product A	Meat Product B
Environmental condition	Minimum	Minimum	Minimum
Change in the product price	No change in standard price	+10%	+10%
Social Responsibility	Minimum	High	Minimum
Food safety	Minimum	Improved	Minimum
Quality	Minimum	Minimum	Improved
Health enhancing benefits	Minimum	Minimum	High
Animal welfare	Minimum	Improved	Minimum
Selection	○	○	○

More Info

>>

Set 2 of 2

Each column describes a different **meat product**. Which of the following meat products would you prefer? Select your choice then click the >> below.

	Standard Meat product	Meat Product A	Meat Product B
Environmental condition	Minimum	Minimum	High
Change in the product price	No change in standard price	+5%	+20%
Social Responsibility	Minimum	High	Improved
Food safety	Minimum	Minimum	Improved
Quality	Minimum	High	Improved
Health enhancing benefits	Minimum	Improved	Improved
Animal welfare	Minimum	Improved	Improved
Selection	○	○	○

More Info

>>

In the previous choice sets which, if any, of the meat product attributes did you ignore when making your choice? Select as many as applicable.

- ❍ Health-enhancing benefits
- ❍ Environmental condition
- ❍ Animal welfare
- ❍ Food safety
- ❍ Social responsibility
- ❍ Quality
- ❍ Change in the product price

Set 1 of 2

Each column describes a different **dairy product**. Which of the following dairy products would you prefer? Select your choice then click the >> below.

	Standard Dairy product	Dairy Product B	Dairy Product A
Environmental condition	Minimum	Minimum	High
Social Responsibility	Minimum	Minimum	Minimum
Change in the product price	No change in standard price	+20%	+10%
Food safety	Minimum	High	Minimum
Health enhancing benefits	Minimum	High	High
Animal welfare	Minimum	Minimum	Minimum
Quality	Minimum	Minimum	Improved
Selection	○	○	○

More Info

>>

Set 2 of 2

Each column describes a different **dairy product**. Which of the following dairy products would you prefer? Select your choice then click the >> below.

	Standard Dairy product	Dairy Product B	Dairy Product A
Environmental condition	Minimum	Improved	Improved
Social Responsibility	Minimum	Improved	Improved
Change in the product price	No change in standard price	+10%	+20%
Food safety	Minimum	High	Minimum
Health enhancing benefits	Minimum	High	Improved
Animal welfare	Minimum	Minimum	High
Quality	Minimum	High	High
Selection	○	○	○

More Info

>>

In the previous choice sets which, if any, of the dairy product attributes did you ignore when making your choice? Select as many as applicable.

- ❍ Health-enhancing benefits
- ❍ Environmental condition
- ❍ Animal welfare
- ❍ Food safety
- ❍ Social responsibility
- ❍ Quality
- ❍ Change in the product price

Set 1 of 2

Each column describes a different **fruit and vegetable product**. Which of the following fruit and vegetable products would you prefer? Select your choice then click the >> below.

	Standard Fruit & Vegetable product	Fruit & Vegetable Product B	Fruit & Vegetable Product A
Quality	Minimum	Improved	Minimum
Environmental condition	Minimum	Improved	Improved
Food safety	Minimum	Minimum	Improved
Change in the product price	No change in standard price	+10%	+10%
Social Responsibility	Minimum	Minimum	High
Health enhancing benefits	Minimum	Minimum	High
Animal welfare	Minimum	Minimum	Minimum
Selection	○	○	○

More Info

>>

Set 2 of 2

Each column describes a different **fruit and vegetable product**. Which of the following fruit and vegetable products would you prefer? Select your choice then click the >> below.

More Info

	Standard Fruit & Vegetable product	Fruit & Vegetable Product B	Fruit & Vegetable Product A
Quality	Minimum	High	High
Environmental condition	Minimum	High	High
Food safety	Minimum	Improved	High
Change in the product price	No change in standard price	+20%	+10%
Social Responsibility	Minimum	Improved	Improved
Health enhancing benefits	Minimum	High	Improved
Animal welfare	Minimum	Minimum	High
Selection	○	○	○

>>

In the previous choice sets which, if any, of the fruit and vegetable product attributes did you ignore when making your choice? Select as many as applicable.

- ❍ Health-enhancing benefits
- ❍ Environmental condition
- ❍ Animal welfare
- ❍ Food safety
- ❍ Social responsibility
- ❍ Quality
- ❍ Change in the product price

Set 1 of 2

Each column describes a different **wine product**. Which of the following wine products would you prefer? Select your choice then click the >> below.

	Wine Product A	Standard Wine product	Wine Product B
Food safety	High	Minimum	Minimum
Environmental condition	Improved	Minimum	Improved
Animal welfare	Minimum	Minimum	High
Quality	Minimum	Minimum	Minimum
Change in the product price	+5%	No change in standard price	+5%
Health enhancing benefits	Minimum	Minimum	Improved
Social Responsibility	Minimum	Minimum	High
Selection	○	○	○

More Info

>>

Set 2 of 2

Each column describes a different **wine product**. Which of the following wine products would you prefer? Select your choice then click the >> below.

	Wine Product A	Standard Wine product	Wine Product B
Food safety	Minimum	Minimum	Improved
Environmental condition	High	Minimum	Minimum
Animal welfare	High	Minimum	Minimum
Quality	Improved	Minimum	Improved
Change in the product price	+5%	No change in standard price	+10%
Health enhancing benefits	Minimum	Minimum	Improved
Social Responsibility	High	Minimum	Minimum
Selection	○	○	○

More Info

>>

In the previous choice sets which, if any, of the wine product attributes did you ignore when making your choice? Select as many as applicable.

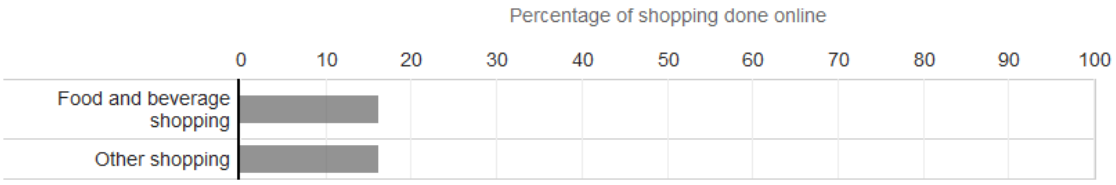
- ❍ Health-enhancing benefits
- ❍ Environmental condition
- ❍ Animal welfare
- ❍ Food safety
- ❍ Social responsibility
- ❍ Quality
- ❍ Change in the product price

The next set of questions are about use of technology for food and beverage shopping.

Do you use any of the following to **search for information** on food and beverages online?

	Never	Rarely	Sometimes	Often	All the time	Don't know
Social Media	❍	❍	❍	❍	❍	❍
Food company web pages	❍	❍	❍	❍	❍	❍
Food blogs	❍	❍	❍	❍	❍	❍
Wikipedia	❍	❍	❍	❍	❍	❍
Chat rooms	❍	❍	❍	❍	❍	❍
Forums	❍	❍	❍	❍	❍	❍
Other, please specify	❍	❍	❍	❍	❍	❍

What percentage of your shopping is done online? Drag the bars across to indicate the percentage relevant to you.



What is the main reason for shopping for food and beverages online?

- ❍ Prices are generally lower online.
- ❍ Comparisons of food and beverages are easier to make online.
- ❍ The variety of food and beverages is greater online.
- ❍ The quality of food and beverages is better online.
- ❍ I like the convenience of having products delivered to my house.
- ❍ I like being able to order food and beverages from overseas that are better or not available domestically.
- ❍ Other, please specify _____

Do you own a mobile device (e.g. smart phone)?

- ❍ Yes
- ❍ No

Have you ever used a mobile app to find out more about a food product and beverages?

- ❍ Yes
- ❍ No
- ❍ Don't know

Do you use your mobile device to purchase food and beverages?

- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Often
- ❍ All of the Time

Have you ever used your mobile device in conjunction with barcodes and/or QR codes for purchasing food and beverages? An example of a QR code:

- ❍ Yes
- ❍ No
- ❍ Don't know

Have you ever used your mobile device in conjunction with barcodes and/or QR codes for finding information about food and beverages?

- ❍ Yes
- ❍ No
- ❍ Don't know

Have you ever used **microchip reading technology**?

Examples of this technology include contactless smart card payment (e.g. MasterCard PayPass/Visa PayWave) or Google Wallet (via your smartphone).

Visa PayWave technology:

- ❍ Never
- ❍ Rarely
- ❍ Sometimes
- ❍ Often
- ❍ All of the time
- ❍ Don't know what this is

Do you **verify** a food and beverage product's **credentials** with any of the following:

	Never	Rarely	Sometimes	Often	Always
Barcode	❍	❍	❍	❍	❍
QR code	❍	❍	❍	❍	❍
Microchip reading technology	❍	❍	❍	❍	❍
Other, please specify	❍	❍	❍	❍	❍

If available, **would you verify** a food and beverage product's **credentials** with any of the following:

	Never	Rarely	Sometimes	Often	Always
Barcode	❍	❍	❍	❍	❍
QR code	❍	❍	❍	❍	❍
Microchip reading technology	❍	❍	❍	❍	❍
Other, please specify	❍	❍	❍	❍	❍

The next questions are specifically about timber products.

How often do you purchase timber, paper and pulp products?

	Never	Rarely	Sometimes	Often	Always
Paper & pulp products	❍	❍	❍	❍	❍
Furniture	❍	❍	❍	❍	❍

How important are the following attributes when purchasing timber, paper and pulp products?

	Very important	Important	Neither	Unimportant	Not at all important	Don't know
Price	❍	❍	❍	❍	❍	❍
Timber produced from plantation forest	❍	❍	❍	❍	❍	❍
Environmentally-friendly production	❍	❍	❍	❍	❍	❍
Quality	❍	❍	❍	❍	❍	❍
Fair Trade	❍	❍	❍	❍	❍	❍
Forest Stewardship Council (FSC) certification	❍	❍	❍	❍	❍	❍
Programme for the Endorsement of Forest Certification (PEFC)	❍	❍	❍	❍	❍	❍

Demographics

The following questions will help us to compare our survey with the general population. Please remember that this is an anonymous survey, and that you cannot be identified from any information you provide.

Gender

- ❍ Male
- ❍ Female

Age

- ❍ 16-29
- ❍ 30-44
- ❍ 45-59
- ❍ 60-64
- ❍ 65-74
- ❍ 75+

Please indicate which of the following best describes your household make-up:

- ❍ Single, no children
- ❍ Single with children
- ❍ Couple, no children
- ❍ Couple with children
- ❍ Live with unrelated people (e.g. flatting)
- ❍ Other _____

Please indicate how many of your children fall into the following age groups. Please select from the drop-down box.

	0	1	2	3+
0-4 years old	❍	❍	❍	❍
5-12 years old	❍	❍	❍	❍
13-17 years old	❍	❍	❍	❍
18+ years old	❍	❍	❍	❍

What is the highest level of education of a member in your household?

- ❍ Up to Primary School
- ❍ Up to High School
- ❍ High School
- ❍ Tertiary qualification other than Degree (e.g. diploma, vocational, etc)
- ❍ University degree
- ❍ Post-graduate degree/diploma/certificate
- ❍ Other _____

That was the last question of the survey!

If you press the submit button you give consent to participate in this research and you will not be able to withdraw your information at a later date. Thank you very much for your participation.

Click **>>** to be returned to the research company website (this may take a few moments).

RESEARCH REPORT

309 Public Opinion on Freshwater Issues and Management in Canterbury
Cook, Andrew 2008

310 Biodiversity Management: Lake Rotoiti Choice Modelling Study
Kerr, Geoffrey N. and Sharp, Basil N.H. 2008

311 The Key Elements of Success and Failure in the NZ Kiwifruit Industry
Kilgour, M., Saunders, C., Scrimgeour, F. and Zellman, E. 2008

312 The Key Elements of Success and Failure in the NZ Venison Industry
Shadbolt, N.M., McDermott, A., Williams, C., Payne, T., Walters, D. and Xu, Y. 2008

313 The Key Elements of Success and Failure in the NZ Dairy Industry
Conforte, D., Garnevska, E., Kilgour, M., Locke, S. and Scrimgeour, F. 2008

314 A Review of Research on Economic Impacts of Climate Change
Kaye-Blake, W., Greenhalgh, S., Turner, J., Holbek, E., Sinclair, R., Matunga, T. and Saunders, C. 2009

315 Managerial Factors in Primary Production: Data from a sample of New Zealand Farmers with an Emphasis on Experience as a Factor in Success
Nuthall, Peter 2009

316 Modelling Climate Change Impacts on Agriculture and Forestry with the extended LTEM (Lincoln Trade and Environment Model)
Saunders, C., Kaye-Blake, W. and Turner, J. 2009

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